

# Impacts of Climate Change on the Yosemite National Park

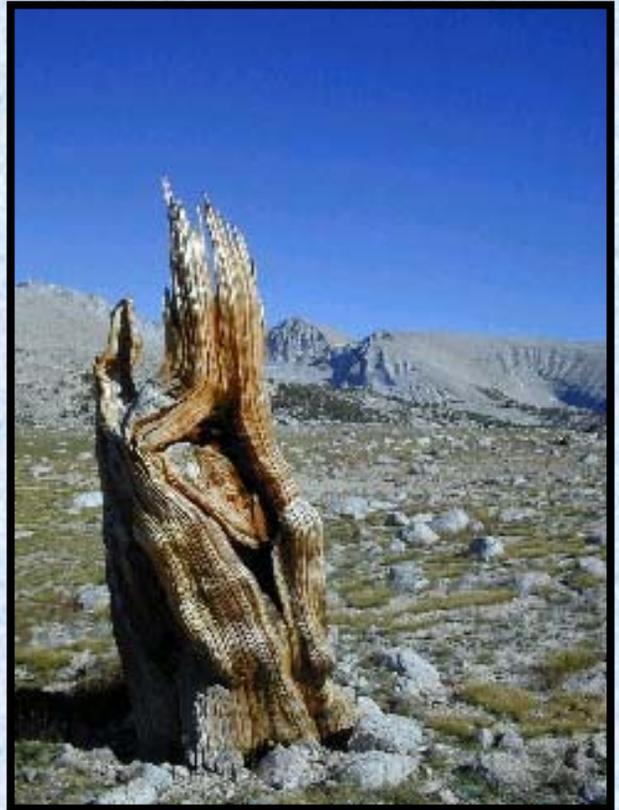
## About the park

Yosemite National Park is located in the central Sierra Nevada, roughly east of San Francisco, California and it is the most famous glacially carved landscape in the world. It was founded on October 1, 1890. The park harbors a grand collection of waterfalls, meadows, and forests that include groves of giant sequoias, the world's largest living things. Yosemite has more than 300 species of vertebrate animals, and 85 of these are native mammals and contains five major vegetation zones: chaparral/oak woodland, lower montane, upper montane, subalpine and alpine.

## Impacts on forests

- Global climate change can impact the park's magnificent waterfalls, sub-alpine meadows, and giant sequoias, the forested areas of Yosemite National Park, which are expected to decline by up to 25-50 percent.
- Studies suggest that along the Sierras, drier conditions could reduce the range and productivity of conifer and oak forests.
- Also a significant increase in the extent of grasslands and chaparral throughout the state could result. The paleoecological record indicates that future warming is unlikely to cause an expansion of subalpine forests if it is accompanied by a reduction in water supply.

Fact sheet prepared by Anna Argyridou for the class of Environmental Analysis and Problem solving at Macalester College.



A dead trunk above current tree line from a foxtail pine that lived about 1000 years ago.  
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## Water systems

It is known that cold-water species do not adapt to warmer waters so that can imply that fisheries might decline. California supports the southern-most populations of some salmon and steelhead species that require cold water.

## Water systems cont.

- As waters warm and stream flows fluctuate, these species could decline drastically or become extinct. Specifically it is likely that warming rivers and streams at Yosemite National Park could devastate whitefish, brook trout, and Chinook salmon populations.
- In addition rivers and lakes are likely to have lower levels of dissolved oxygen as waters warm in addition to low nutrient availability, stressing ecosystems and fish.
- Evidence show that freshwater pollution, which could increase as streamflows decrease, will further endanger fish.



Fire Regimes in Sierran Mixed-Conifer Forests  
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## Fires

- Yosemite National Park, once described by John Muir as, "a paradise that makes even the loss of Eden seem insignificant, is in danger of increased fires and drought from rising temperatures.
- The combination of dry vegetation, low relative humidity, and thunderstorms results in frequent lightning-caused fires as well.
- Hotter, drier weather could increase the frequency and intensity of wildfires, threatening the property, forests and the species in the park.

## Water resources/ glacial melting

- Climate change will have an impact on water resources. Evaporation is likely to increase with an increase in temperature, resulting in lower river flow and lower lake levels as well as low levels of groundwater.
- In addition, more intense precipitation could increase flooding. The Yosemite National Park has had 11 winter floods since 1916 that have caused substantial damage.
- There is strong evidence that the snow packs are melting earlier than before in the Yosemite National Park and they have shrunken dramatically (up to 75%).

## Pollution

- Increase in fossil fuel burning, has negative impacts on systems like the Yosemite. Existence of ozone pollution is higher than average due to the warm and sunny climate of California, putting plants with low population numbers in danger.
- In addition, the park is susceptible to acidification that reduces growth since it can remove soil nutrients and makes plants more vulnerable to disease, droughts and pests.

## Useful links

### 1. Sierra Nature Notes

[www.yosemite.org/naturenotes/](http://www.yosemite.org/naturenotes/)

### 2. Climate Change impacts on California

[www.usgcrp.gov/usgcrp/nacc/california.htm](http://www.usgcrp.gov/usgcrp/nacc/california.htm)

### 3. Yosemite National Park

[www.nps.gov/yose/manage/](http://www.nps.gov/yose/manage/)